SPIRE

Stimulating Public-sector Implementation of Renewable Energy

Innovative Energy Strategies for the Public Sector

When it comes to energy, California's local governments have been innovators for a long time. With electricity and natural gas price spikes and mounting evidence of global climate change, cities, counties and other local agencies can play a large role in fostering creative solutions that reduce costs, boost reliability, and shrink the environmental footprints linked to energy production and consumption.

One strategy is through distributed renewable energy systems, which growing numbers of local governments are installing in response to a variety of state financial incentives – including the California Energy Commission's Emerging Renewable Buy-Down Rebates. Available to all local governments served by investor-owned utilities, these rebates can cover up to half of the installation costs of a new solar photovoltaic (PV) system – an ideal distributed electricity generation source for local governments.

Renewables Help Your Bottom Line

A combination of state rebate incentives, low-interest financing and bulk procurement makes self-generation a cost-effective option for the public sector's energy needs. Given the volatility of the electric utility industry, investing in renewable energy sources can guarantee stable, long-term energy prices and supply while helping to budget for fixed energy costs. For a limited time, local governments, schools and special districts can substantially cut their energy costs by taking advantage of these unprecedented rebate incentives and financing opportunities – some municipalities can even save money from the first day of installation.

CASE STUDIES

Santa Monica
The world's first city to convert to all-green power

Santa Cruz
Photovoltaic energy brings new power to City Hall

Alameda County
The largest rooftop PV in the United States – at the county jail

A California Renewable Energy Program

Santa Monica Goes Green

Through its Sustainable City Initiative, the City of Santa Monica has demonstrated a commitment to green energy. The City made history on June 1, 1999, as green electricity began powering all municipal facilities – including the Santa Monica Airport, City Hall and the famous Santa Monica Pier – making it the first city in the world to do so. The city purchases approximately 5 megawatts (MW) of renewables, equivalent to the electricity used by 5,000 to 6,000 homes.

Under a South Coast Air Quality Management District grant, a demonstration 2.1 kilowatt (kW) PV charging station for electric vehicles was completed in January 1996 at Santa Monica City Hall. The station can accommodate up to seven electric vehicles simultaneously; two of the charging ports are open for public use free of charge. Integral to the station is an extensive public education display that presents information about electric vehicles, solar power and alternative transportation. Based on the project's success, Santa Monica subsequently installed a 31.2 kW solar port at the civic auditorium, just south of City Hall.

The City also worked with Edison Technology Solutions to install a 50 kW solar array to power the world's first solar ferris wheel at the Santa Monica Pier in 1999.

Most recently, the City partnered with the Community Corporation of Santa Monica to develop Colorado Court, a 44-unit affordable housing development with a 48 kW distributed generation system consisting of a 20 kW PV system and a 28 kW gas-powered micro turbine system that uses waste heat for all domestic hot water. Building integrated photovoltaics (BIPV) are located on the building's south-facing exterior. The City is working closely with the U.S. Green Building Council to achieve the highest Leadership in Energy and Environmental Design (LEED) rating possible for Colorado Court.

Santa Cruz City Hall

In July 2001, the City of Santa Cruz installed a 14 kW PV system on its City Hall Annex. The system will generate an average of 25,000 kilowatt hours (kWh) of electricity each year, providing enough electricity for about 7% of the power used in the building. The PV modules are mounted on a frame system that hugs the building's south facing roofline.

The purchase was made possible by the California Energy Commission's Renewable Buy-Down Rebate – which covered nearly half the system's $133,000 cost – and a $40,000 grant from the Palo Alto Municipal Utility obtained with the help of Ecology Action, a local nonprofit organization. The project's total cost was about $9 per watt; however, the city's total cost was only $27,600 due to grants and rebates. The City hired a contract engineer to issue an RFP for a design/build team and oversee the entire project.

"The City and City Council are interested in moving forward with renewable power wherever they can," said Public Works Analyst Mary Arman. Several other sites have been targeted, including the municipal corporation yard, the wastewater treatment plant and the landfill's recycling center.

Alameda County's Santa Rita Jail

Alameda County installed 5,700 photovoltaic cells on its Santa Rita Jail, making it the largest rooftop solar PV system in the nation.

Begun in June 2001, the 642 kW PV system is just one of the county's technological innovations to retrofit the jail for energy-efficiency and self-generation – and the first of many solar-power systems that the county will adopt over the next few years.

The county began looking at how to reduce energy demand at the jail in 1993. The energy-efficiency programs included retrofitting over 12,000 fluorescent light fixtures, installing occupancy sensors and other advanced lighting controls, and installing a highly solar-reflective, "Cool Roof" membrane. By reflecting 65% of the sun's energy that hits the roof, summer rooftop temperatures are cut by 50° F., thereby reducing air conditioning requirements. The jail was also retrofitted with a more efficient central plan-cooling tower and a computerized Smart Energy Management System.

By starting with energy-efficiency retrofits and adding the rooftop PV system, Alameda County was able to reduce peak power consumption by 20% without any general fund expenditure. Instead, the county leveraged a variety of state subsidies, including $2.5 million from the California Energy Commission's Emerging Renewable Technology Buy-Down Rebate; $425,000 in State Peak Load Reduction funds for the PV System, the air-conditioning demand response system, and Cool Roof; and $250,000 from the CPUC's "cost-cutting demand" program. Another $980,000 was financed by a fixed 6% interest loan from the California Energy Commission's Energy Efficiency Financing Program for local governments – which will be paid off by the savings achieved by reduced electricity use over the next 11 years.

The County's net savings will average about $295,000 annually over the next 25 years, or about $7 million in total savings over the life of the project (based on July 2001 electricity rates).

The Santa Rita Jail project also provides an added environmental benefit by displacing almost 9 million pounds of carbon dioxide and 2,900 pounds of nitrogen oxides – gasses associated with global climate change and urban smog, respectively – as a result of its reduced utility power purchases.

Is Renewable Energy Cost-Effective for You?

Start with your annual electric consumption and cost.. The PV Calculator * determines the cost per kilowatt hour (kWh) or a PV system that meets your needs.

Your current electric consumption (**A**) = _____ kWh/yr
Your current electric bill (**B**) = $ _____ / year

Projected 30-year electricity cost:
- with no price escalation: **B** x 30 years x 1.00 = $_____
- with 1% price escalation: **B** x 30 years x 1.16 = $_____
- with 5% price escalation: **B** x 30 years x 2.20 = $_____

Amount of PV energy (**C**) needed to meet your annual electric load:
A_____ ÷ annual sun hours _____ hr/yr = **C** _____ kW

Enter your "full sun hours," which range from 1,500 hr/yr in Northern CA to 1,750 hr/yr in Central CA to 2,000 hr/yr in Southern CA

Amount of unobstructed south access area needed to generate that load:
100 sq. ft. / kW x **C** _____ = _____ sq. ft.

Your Net Cost after Buydown:
PV Cost $_____ – Buydown $_____ = Net Cost $_____

PV Cost ranges from $6,000 to $12,000 per kW;
Buydown is 50% of cost up to a maximum of $4,500/kWh

Your Cost per kWh: Net Cost $_____ ÷ (**A** x 30 yrs) = $_____ / kWh

To determine the "Simple Payback" of this PV system:

Net Cost $_____ ÷ 30-year electricity cost *(with or without escalation)* = **D**_____

How long it will take to pay back the system cost: **D** x 30 = ____ years

** A simple tool developed by the Renewable Energy Development Instituteto provide an approximation of relative PV costs and benefits.*

Renewable Energy Checklist

How can local governments, schools and special districts encourage renewable energy use in the public sector?

- Consider installing PV cells on municipal facilities and projects:
  - ☐ New municipal and civic buildings
  - ☐ New city-sponsored residential projects
  - ☐ Re-roof or retrofit existing facilities
  - ☐ Covered parking structures
  - ☐ Shade structures for picnic areas, playgrounds, schools or parks
  - ☐ Community centers
- Encourage your city or county to:
  - ☐ Waive building permit fees for residential and commercial renewable energy systems
  - ☐ Update city/county codes to address installation of solar PV and small wind turbines
- Use state rebate incentives:*
  - ☐ California Energy Commission's Emerging Renewable Technology Buy-down Account
  - ☐ Self Generation Incentive Program administered by investor-owned utilities
- Explore low-interest, long-term financing:*
  - ☐ State of California
  - ☐ Independent financing entities
  - ☐ Third Party Providers
- Evaluate procurement options for turnkey renewable energy systems:*
  - ☐ California Department of General Services Procurement Division
  - ☐ California Power and Conservation Financing Authority
  - ☐ Issue an RFQ and/or RFP for a specific project
  - ☐ Aggregate purchases through a buying cooperative or other organization
  - ☐ Contract with a third-party provider to become a host site for a renewable energy system
- Install a PV system:
  - ☐ Use local expertise and/or staff
  - ☐ Use knowledge gained in SPIRE workshops
  - ☐ Contract with an installer
- Get free technical assistance:
  - ☐ Local Government Commission, (800) 290-8202
  - ☐ Renewable Energy Development Institute, (707) 459-1256

* For more information, order the Renewable Energy Assistance Packet:

www.lgc.org/techserve/spire • (800) 290-8202

SPIRE

We Can Help

The Local Government Commission is offering Stimulating Public-sector Implementation of Renewable Energy (SPIRE) – a program designed to offer financing and procurement opportunities to help municipalities implement renewable energy solutions. SPIRE is made possible by a Renewable Energy Consumer Education grant from the California Energy Commission.

To find out how SPIRE can help you, or get a copy of the Renewable Energy Assistance Packet, call (800) 290-8202 or visit www.lgc.org/techserve/spire.

Renewable Energy Program
California Energy Commission

Local Government Commission

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